

CPAT Report No. 1510-1

Clocaenog Forest 132kV electrical substation




Archaeological Watching Brief



YMDDIRIEDOLAETH ARCHAEOLEGOL CLWYD-POWYS

CLWYD-POWYS ARCHAEOLOGICAL TRUST

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Prepared by:	Checked by:	Approved by:
		
Richard Hankinson Senior Archaeologist	Paul Belford Director	Paul Belford Director
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YMDDIRIEDOLAETH ARCHAEOLEGOL CLWYD-POWYS
 CLWYD-POWYS ARCHAEOLOGICAL TRUST

41 Broad Street, Welshpool, Powys, SY21 7RR, United Kingdom

+44 (0) 1938 553 670

trust@cpat.org.uk

www.cpat.org.uk

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 with the Chartered Institute for Archaeologists

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Summary

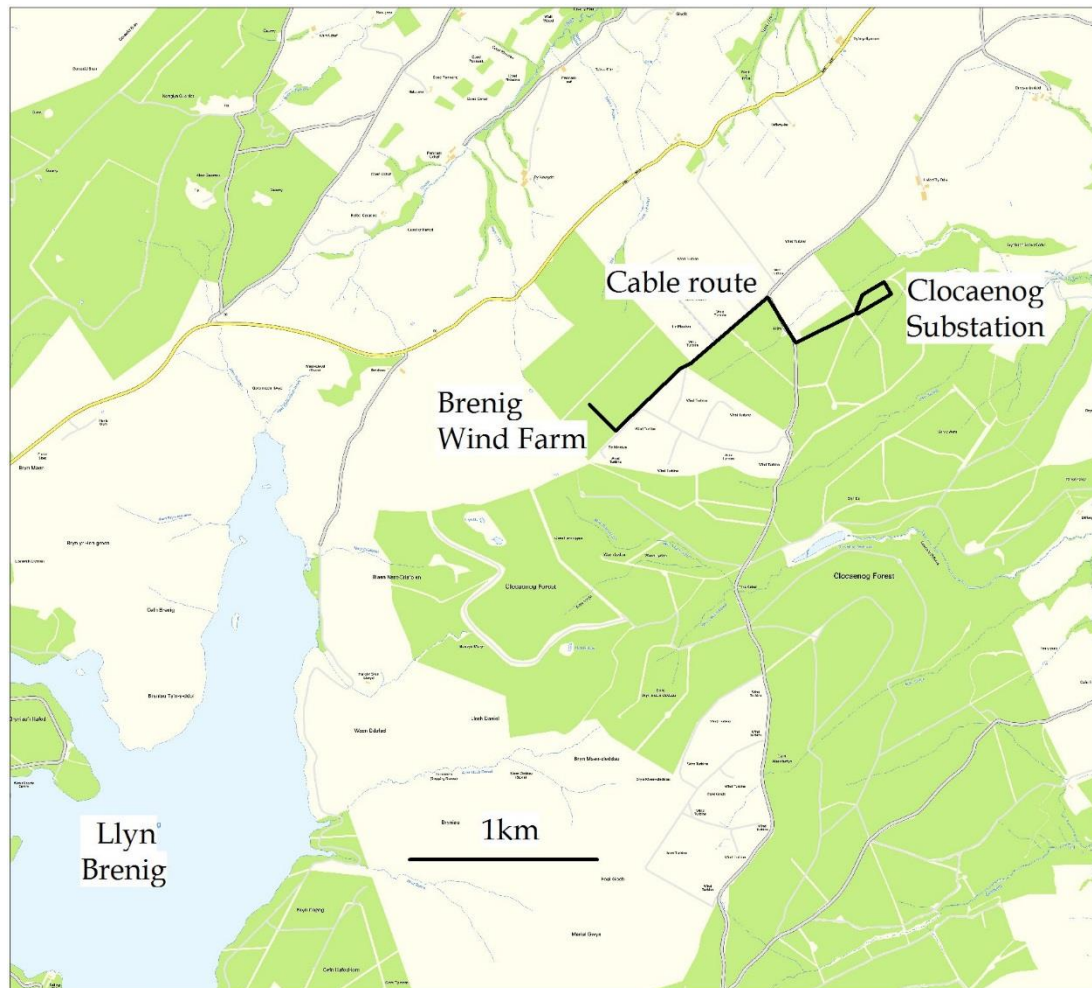
A watching brief was carried out during soil stripping prior to the construction of a new electrical substation in Clocaenog Forest (NGR: SJ 0130 5877) designed to serve the local wind farms. No archaeological features or artefacts were observed in the stripped area; conditions were good for their detection if any had been present.

In addition to the watching brief, it had been recommended that appropriate signage was erected along the site access routes to ensure that a Scheduled Ancient Monument (SAM DE088, Twr yr Hill Round Barrow) was avoided by site plant and vehicles. This was checked and found to be effective; the presence of the monument and the need for its avoidance was also highlighted as part of the site induction process.

The new substation was connected to the newly developed wind farm at Llyn Brenig via a cable route that ran to a further substation within the wind farm at NGR SH 9991 5830. No significant archaeological remains were found during monitoring of this work, which took place in October and November 2017.

1 Introduction

- 1.1. The Clwyd-Powys Archaeological Trust (CPAT) were engaged by Iberdrola Engineering and Construction to undertake a watching brief during the topsoil strip phase preceding the construction of a new 132kV electrical substation in Clocaenog Forest, Denbighshire (NGR SJ 0130 5877; Fig. 1). The development was located approximately 3km north-east of the Llyn Brenig Reservoir and was built as part of a wider scheme to provide grid connections for wind farms in North Wales.



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Fig. 1: Location of the Substation and cable route

- 1.2. Mitigation measures for the construction phase were detailed in CPAT Written Scheme of Investigation (WSI) No 1691-1B (Appendix 1), which recommended an archaeological watching brief be conducted during initial soil stripping over the area of the substation and any associated compounds or laydown areas with a view to recording any archaeological features which were present.
- 1.3. A scheduled ancient monument (SAM DE088; Twr yr Hill Round Barrow) was identified within 1km of the development area (Fig. 2) and this lay close to a forest road linking the two access routes to be used during construction. WSI 1691-1B specified that the immediate locality be avoided and appropriate signage placed at

the relevant points on the access routes to ensure the monument was protected from accidental damage.

- 1.4. The watching brief for the substation was carried out over three consecutive days, in late June 2017 and an interim version of this report was written immediately thereafter. The work on the line of the cable linking the substation to the Brenig Wind Farm was carried out in October and November 2017. The final version of the report was produced in December 2017.
- 1.5. The watching brief was conducted according to the Chartered Institute for Archaeologists' (Cifa) *Standard and Guidance for an Archaeological Watching Brief* (2014).

2 Watching Brief

- 2.1. The watching brief confirmed that the appropriate signage was in place to ensure that the scheduled ancient monument (SAM DE088) was avoided by vehicles accessing the substation area and that this was being observed. The site induction process highlighted the issue with the scheduled monument and site contractors were aware of its presence.



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Fig. 2: Location of the Clocaenog Substation in relation to SAM DE088

Clocaenog Substation

- 2.2. The soil stripping covered two conjoined areas, that to the north-east being the location of the substation and that to the south-west being the area of a site compound, these are not differentiated in Fig. 2. Prior to the beginning of work, the area was a forestry plantation, but by the commencement of the watching brief this had been felled and the stumps removed. The soil stripping was carried out by two machine excavators using toothless buckets, under close archaeological supervision.
- 2.3. In both cases, the soils that were encountered comprised an upper layer of 0.2-0.3m of black and brown peat, which covered up to 10cm of pinkish-brown clay silt and a lower deposit of variable yellow-grey to orange silt. The lower deposit constituted the local natural subsoil.



Fig. 3: The soil stripped area at the Clocaenog Substation, from the east. Photo CPAT 4362-0003.

- 2.4. No archaeological features or artefacts were observed in either of the areas. Some marks were seen in the natural subsoil, resulting from drainage work associated with forestry planting, but this was not considered to be significant. The coniferous plantation that previously lay on the site had evidently been shallow-rooted and had affected only the upper two layers.

Cable Trench between Clocaenog and Brenig Wind Farm Substations

- 2.5. As part of works associated with the construction of the sub-station, a 10m-wide corridor was cleared as preparation for the excavation of a cable trench, connecting the Clocaenog substation with a second substation at the newly constructed Brenig Wind Farm. The corridor initially passed through a section of coniferous forestry, then skirted the edge of a pasture field before entering the Brenig Wind Farm, where it crossed an area recently cleared of forestry.

- 2.6. The total length of the corridor was approximately 1200m, which was stripped in three phases. Phase 1 consisted of the forested area, phase 2 being where the corridor skirted the edge of the pasture, and phase 3 where the corridor crossed over into the Brenig Wind Farm site. The monitoring strategy was based on the method employed on the Brenig Wind Farm site, where the aim in all de-forested areas, was to monitor at least 25% of the total area stripped.
- 2.7. The excavation method involved the removal of tree-stumps with a toothed bucket, before clearing the remaining vegetation and soils down to the top of the natural subsoil horizon using a toothless ditching blade.
- 2.8. Phase 1, from the substation to the tarmac road running through the forest, was approximately 400m long. Two separate lengths of corridor were monitored totalling approximately 150m. Excavation revealed a dark brown humic topsoil, with a greyish, gleyed horizon of silty clay immediately beneath. The natural subsoil comprised an orange, firm, stony and silty clay.
- 2.9. No significant archaeological remains were found during this phase, but there was evidence of channels associated with the drainage of the forest.



Fig 4: Phase 1 of cable trench, showing a surface drainage channel. Photo CPAT 4362-0007

- 2.10. Phase 2 was approximately 300m long, and ran along the edge of the forested area, with open pasture to the north. Machine stripping here revealed a dark brown peaty topsoil, overlying a thin horizon of gleyed grey silty clay subsoil. The natural subsoil below was an orange, stony and silty clay. No significant archaeological remains were identified in this phase.



Fig 5: Phase 2 of cable trench, bordering pasture fields. Photo CPAT 4362-0011

- 2.11. Phase 3 was approximately 400m long, and continued the line of phase two for 250m, bordered by pasture to the south, before turning through ninety degrees across a recently deforested area to link up with the Brenig Wind Farm substation.
- 2.12. Approximately 200m of this phase was monitored on two separate visits, but no significant archaeology was revealed.

3 Conclusions

- 3.1. The watching brief on both the sub-station and the cleared corridor of the cable trench did not reveal significant archaeological features or artefacts. The conditions and methods of excavation were suitable for the recognition of both and sufficient time was available to examine the stripped area in detail.
- 3.2. The signage designed to ensure that Scheduled Ancient Monument DE088 was avoided by site plant and vehicles was checked and found to be satisfactory. The presence of the monument and the need for its avoidance formed part of the site induction process. At the time of completion of the watching brief, SAM DE088 had been successfully protected.

4 Archive deposition Statement

- 4.1. The project archive has been prepared according to the CPAT Archive Policy and in line with the *CIfA Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives guidance* (2014). The archive will be deposited with the regional Historic Environment Record, maintained by CPAT in Welshpool; no artefacts were recovered. A summary of the archive is provided below.

Site Archive Summary

CPAT Event PRN: 140184

15 digital photographs, CPAT Film No 4362

8 Watching brief record forms

Appendix 1: CPAT WSI 1691-1B

1 Introduction

- 1.1. The Field Services Section of the Clwyd-Powys Archaeological Trust (CPAT) were initially invited by Arcadis Consulting (UK) Ltd, on behalf of Iberdrola Engineering and Construction, to prepare a Written Scheme of Investigation (WSI) for archaeological mitigation works associated with the construction of a new 132kV electricity substation, with associated works, at Clocaenog Forest, Denbighshire (SJ 0128 5876). The substation is to be constructed as part of a wider scheme to provide a connection for wind farms in North Wales. The WSI has subsequently been revised to take account of the final scheme design, including access routes, as well as the results from an archaeological assessment (Jones 2016) for the substation and underground cabling.

2 Aims and Objectives

- 2.1. The aims of the archaeological mitigation are:
- To ensure the preservation in situ of Twr yr Hill Round Barrow, SAM DE088
 - To ensure the preservation by record of any previously unrecorded, buried archaeological deposits, features or artefacts which may be revealed during the groundworks associated with the substation and any compounds or laydown areas
- 2.2. The objectives of the archaeological mitigation are:
- To provide advice and technical support to enable the preservation in situ of Twr yr Hill Round Barrow, SAM DE088, prior to the commencement of site works
 - To undertake an archaeological watching brief during relevant groundworks
 - To investigate and record any archaeological deposits, features or artefacts which may be revealed
 - To undertake appropriate post-excavation analysis and reporting
 - To produce a report on the results from the watching brief

3 Mitigation

Avoidance

- 3.1. The original scheme of mitigation included demarcation around the scheduled ancient monument known as Twr yr Hill Round Barrow, SAM DE088 (SJ 010 581). The scheduled area measures around 32m across, centred on the cairn, and an exclusion zone of at least 30m was anticipated beyond the designated area.
- 3.2. The final design for the scheme includes the use of two possible access routes, neither of which would have any potential impact on the scheduled ancient monument. At its closest point the southern access route is at least 55m from the monument. It is therefore no longer considered necessary to demarcate the monument prior to the commencement of works.

- 3.3. However, there is a forestry track which connects the two access routes and passes immediately to the east of the monument. While there are no plans to use this as an access route appropriate signage should be placed at either end of the track prohibiting access for construction vehicles.
- 3.4. The scheduled ancient monument must also be marked clearly on all constraints mapping for the project.
- 3.5. The archaeological assessment identified only two undesignated assets in proximity to the cable routes, including the route of a post medieval trackway (PRN 60539) and a stone (PRN 142225), both identified from the Ordnance Survey 1st edition 25" map of 1874. The area has been much altered by forestry plantation and it is not known whether the stone survives, while the trackway has been superseded by a modern route. Of the two, only the trackway will be subject to a direct impact, although this is considered to be of low value and no mitigation is proposed.

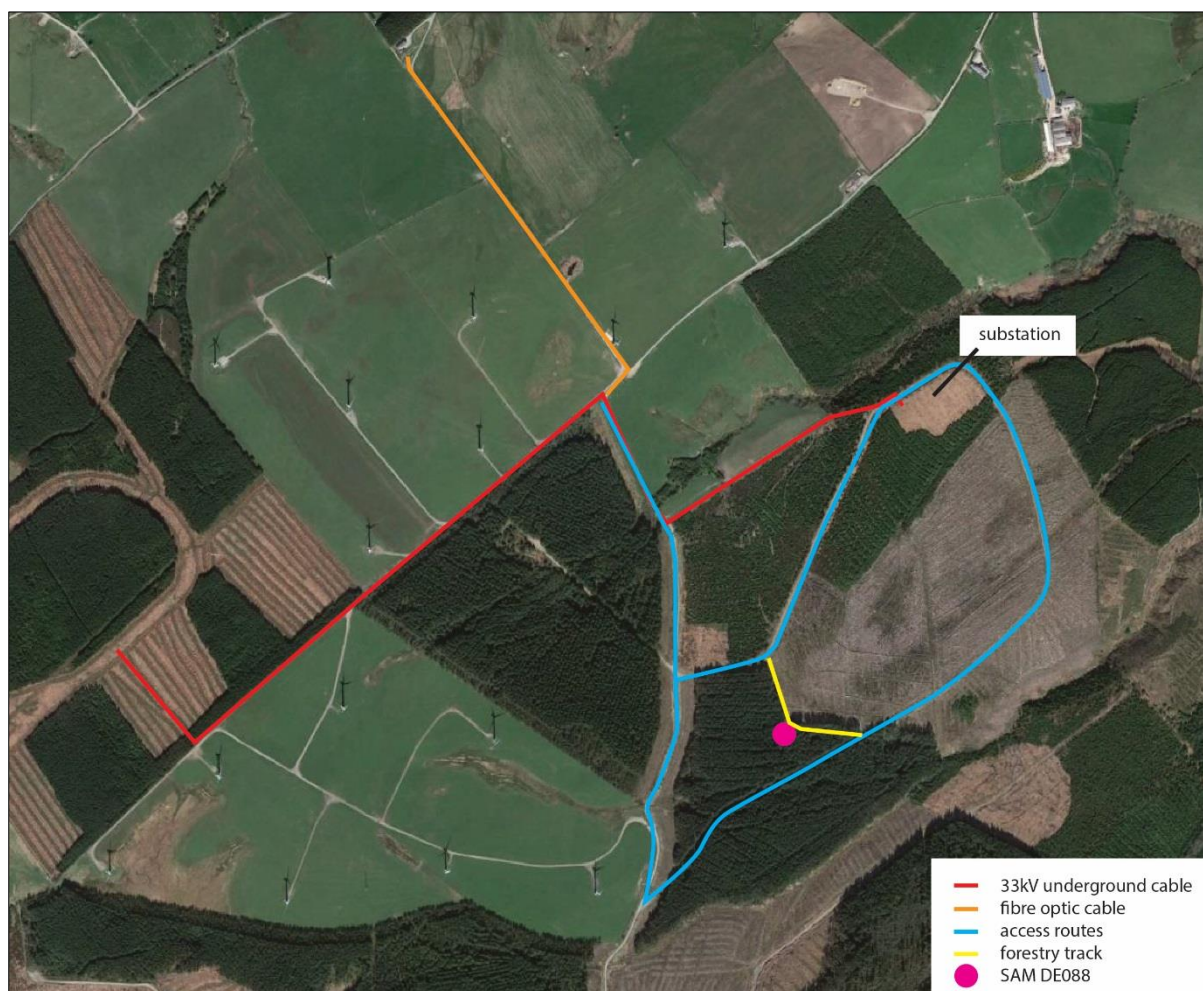


Fig. 1 Location of Clocaenog substation, cable routes and access routes (based on Google Earth)

Watching brief

- 3.6. A watching brief will be maintained during the initial soil stripping within the area of the new substation and any associated compounds or laydown areas.

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- 3.7. The watching brief will be conducted according to the Chartered Institute for Archaeologists' (CIfA) *Standard and Guidance for an Archaeological Watching Brief* (2014). The watching brief will be undertaken to monitor groundworks associated with the construction of the new substation, together with additional groundworks likely to impact on potential buried archaeological deposits.
- 3.8. Topsoil will be stripped from the area using a machine with a flat, toothless blade, under the direct control of an appropriately qualified archaeologist. The archaeologist will be responsible for determining the depth to which machine excavations will be undertaken, which will normally be taken to be the surface of the undisturbed natural subsoil, unless significant archaeological deposits are revealed at a higher level.
- 3.9. Any archaeological features or deposits which are revealed will be excavated by hand and recorded using the conventional techniques for archaeological excavation:
- The presence or absence of archaeological features encountered during the ground works will be noted.
 - Where features of archaeological interest are identified during the ground works they will be systematically investigated by hand with sufficient work being undertaken to determine their date, character and function, using the conventional techniques for archaeological excavation and in accordance with CIfA Standard and Guidance.
 - All features will be located as accurately as possible on an overall plan of the development at an appropriate scale, showing boundaries depicted on Ordnance Survey mapping.
 - Contexts will be recorded on individual record forms, using a continuous numbering system, and be drawn and photographed as appropriate.
 - Plans will be drawn on permatrace to a scale of 1:10, 1:20 or 1:50, as appropriate.
 - All photography will be taken using a digital SLR camera with a minimum resolution of 12 mega pixels, including a metric scale in each view, with views logged in a photographic register.
 - In the event of human burials being discovered the Ministry of Justice will be informed. The remains will initially be left *in situ*, and if removal is required, a MoJ licences will be applied for under the Burial Act 1857.
 - In the event of finding any artefacts covered by the provisions of the Treasures Act 1996, the appropriate procedures under this legislation will be followed.
- 3.10. All artefacts and environmental samples will be treated in a manner appropriate to their composition and a sampling strategy will be developed as appropriate:
- All stratified finds will be collected by context, or where appropriate, individually recorded in three dimensions. Unstratified finds will only be collected where they contribute significantly to the project objectives or are of particular intrinsic interest.
 - All finds and samples will be collected, processed, sorted, quantified, recorded, labelled, packed, stored, marked, assessed, analysed and conserved in a manner appropriate to their composition and in line with appropriate guidance.

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- Arrangements to assess and study any artefacts, assemblages and environment samples.
 - Any artefacts recovered during the watching brief will be deposited with an appropriate regional or national museum, subject to the permission of the owner.
- 3.11. In the event of significant archaeological discoveries the client, contractors and regional archaeological curator will be informed immediately and all work will halt until an agreement has been reached regarding the appropriate archaeological response.

Post-excavation and archive preparation

- 3.12. Following completion of the fieldwork programme any artefacts and environmental samples will be processed, assessed, conserved and packaged in accordance with CIfA's *Standards and Guidance for the collection, documentation, conservation and research of archaeological materials* (2014), and Museums and Galleries Commission Standards in the museum care of archaeological collections (1994).
- 3.13. If justified by the extent of archaeological discovery, a post-excavation assessment will be undertaken following the completion of the fieldwork. A Post Excavation Assessment Report will be prepared and submitted to the regional archaeological curator for approval. Any post-excavation reports will be undertaken in accordance with this document.

Reporting

- 3.14. Following the on-site work an illustrated report will be prepared containing conventional sections to include:
- Non-technical summary
 - Introduction
 - Site location
 - Topography and Geology
 - Archaeological Background
 - Watching brief
 - Conclusions
 - References
 - Appropriate appendices on archives and finds
- 3.15. The site archive will be prepared to specifications in Historic England (2015) *Management of Research Projects in the Historic Environment (MoRPHE)* and the CIfA *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives* (2014), to be deposited with the regional Historic Environment Record (HER) and RCAHMW.

4 Resources and Programming

- 4.1. The watching brief will be undertaken by a skilled archaeologist under the overall supervision of Nigel Jones, a senior member of CPAT's staff who is also a member of the Chartered Institute for Archaeologists (CIfA). CPAT is also a CIfA Registered Organisation (RAO No 6) and as such agrees to abide by their *Code of Conduct* (2014) and the *Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology* (2014).
- 4.2. All report preparation will be completed by or with the assistance of the same field archaeologist(s) who conducted the site work. Copies of the report will be deposited with the client and the regional Historic Environment Record within one month of the completion of on-site works. If appropriate, a short report will be published in *Archaeology in Wales*.
- 4.3. The client should be aware that in the event that significant archaeological remains are revealed there may be a requirement for more detailed excavation and specialist services. Any further work over and above the original watching brief and report would be the subject of a separate WSI and costing. The following figures provide an indication of the types of additional services and indicative costs which might be required, for which the client is advised to make some provision.

Curatorial monitoring	£50 per visit
Finds conservation etc	£285 per day
Radiocarbon dating	£330 each
Finds specialist	£285 per day

- 4.4. Requirements relating to Health and Safety regulations will be adhered to by CPAT and its staff.
- 4.5. CPAT is covered by appropriate Public and Employer's Liability insurance, as well as Professional Indemnity insurance.

5 References

Jones. N. W., 2016. *North Wales Wind Farm Connections: cultural heritage assessment*. CPAT Report No. 1423-1

N W Jones

4 January 2017